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Notes on the Early Larval Stages of the Fiddler Crab, and of Alpheus. By A. S. Packard, Jr. 8vo, pp. 10. Cuts. Extract from the American Naturalist, October. Philadelphia, 1881. From the author.

On a New Cray-Fish, from the Lower Tertiary of Western Wyoming. By A. S. Packard, Jr. 8vo, pp. 10. Cuts. Department of the Interior, United States Geological and Geographical Survey. Government Printing Office, Washington, September 19, 1881. From the author.

Annotated List of Birds of Nevada, by W. J. Hoffman M. D. 8vo, pp. 50. Department of the Interior, United States, Geological and Geographical Survey. Government Printing Office, Washington, 1881. From the author.

Günther's Literature and Morphography of Fishes. A review of Dr. Günther's introduction to the Study of Fishes. By Theodore Gill, M. A., M. D., Ph.D. 12mo, pp. 16. Extract from the "Forest and Stream," New York, 1881. From the author.

The New Botany. A Lecture on the best method of Teaching. By W. J. Beale, M. D., Ph.D. 8vo, pp. 16. From the Transactions of the Twenty-ninth annual Meeting of the Michigan State Teacher's Association, Lansing, 1881. From the author.

Mivart on the Cat, Review of by Prof. George Macloskie. 8vo, pp. 4. From the October number of the Presbyterian Review. New York, 1881. From the author.

The Journal (Formerly Archives) of Comparative Medicine and Surgery. A Quarterly Journal of the Anatomy, Pathology, and Therapeutics of the Lower Animals. New York, 1881. From the publishers.

Beiträge zu einer Kraniologie der europäischen Völker. Von Professor J. Kollmann, in Basel. 4to, pp. 120. 4 plates, colored, cuts. Aus dem "Archiv. für Anthropologie." Band XIII, tes 4. Braunschweig, 1881. From the author.

Essai sur Le Classement des Animaux qui vivent sur la Plage et dans environs de Dunkerque. Troisiéme fascicule. Par M. O. Terquem, ancien Pharmacien. 8vo, pp. 54. 5 plates. 1881.

Photographs of remains of Batrachia of the Coal Measures of Nova Scotia. By J. W. Dawson. Montreal 1881.

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GENERAL NOTES.

BOTANY.[1]

Dimorphism in Black Mustard.—It may not be generally known that there are two forms of flowers in the common mustard (*Brassica nigra*), which differ mainly in the length of the pistil. In the short-styled form, the top of the stigma does not quite reach to the bases of the higher anthers, and is about even with the tips of the lower ones. The long-styled has the stigma reaching to the middle of the higher anthers. The dimensions of the stamens are nearly identical in the two forms.

In each flower, they may be naturally divided into two sets, each set consisting of two long stamens and one short. Those of the same set face toward each other, that is, toward the nectary of the set, which is surrounded by them and the pistil. There are two nectaries, therefore in each flower, and on opposite sides of the pistil. Two advantages of this arrangement should be mentioned: first, the anthers near the pistil turn away from it, so that their pollen does not easily reach it, but rather the bill of the insect which reaches down to the nectary, and second, as the insect passes from one nectary to the other, its bill is likely to carry pollen to the stigma.

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[1] Edited by Prof. C. E. Bessey, Ames, Iowa.

As in other cases of dimorphism, all flowers on the same root have the same form. Much care should be taken in verifying this statement, for, as in both forms the pistil soon elongates, after the flower has passed its prime, it is easy to mistake older flowers of the short-styled form for long-styled ones. But comparing flowers which have just opened, or before they have been fertilized, the facts stated above will be clearly seen. The styles in the two forms differ in length a little less than one millimetre.

The dimorphism in this case seems to be imperfect. There are two lengths of stamens, and two lengths of pistils to correspond, but while the different pistils are distributed to different plants just as in Houstonia, Lithospermum, etc., the different stamens are not even distributed to different flowers. Moreover, the longer stamens are twice as numerous as the shorter. These facts suggest the following queries:

1. May we not have in this case two plans for cross-fertilization coëxisting, viz., one more or less analogous to other cases of heterostylism, and the other like that in the Rosaceæ, etc., where stamens and pistils are equally prominent, to profit by the haphazard movements of insects visiting the flowers?

2. Do similar relations exist, in all the Cruciferæ, or are these variations which indicate a transition stage in the development of dimorphism?

To direct observation and obtain an answer, especially to the latter question, has been one purpose in publishing the facts given above.—*J. E. Todd, Tabor, Iowa.*

MOTION OF THE FRUIT OF TILIA WHILE IN THE AIR.—Every one is familiar with the singular inflorescence of the genus *Tilia*, in which the long peduncle, really axillary to the large papery bract, is so adnate to this for about half its length, as to appear to spring from its middle. Well known as are these lindens or limes, and especially the *Tilia Europæa*, I do not recall having seen any mention of the use that the plant makes of this scale in distributing its fruit. As the globular nuts ripen, the scale becomes more dry and papery. It also bends back upon itself from the point where the peduncle becomes free. It is weighted, as it were, by the fruit balls below. Sometimes moreover, there is a lateral twist to the wing, making it not unlike the fluke of a propeller. Now, when a breeze disengages this apparatus, it falls by its own weight, but, through the influence of the wing, at once begins to revolve rapidly upon its axis, looking like the governor of a steam-engine in rapid motion. I take it there is here a chance for mathematical research, but that is unfortunately out of my line. Will not some botanist of a mechanical turn, if such a being exists, study into this matter a little? I take it that the purpose of the apparatus is, as in the case of the ash, to propel the fruit outside of the immediate radius of the tree. So like butterflies do these scale-borne nuts in the air appear, that I have been repeatedly deceived by them. It seems to me that the subject would reward the diligent study of one who combined good powers of observation with certain mathematical attainments.

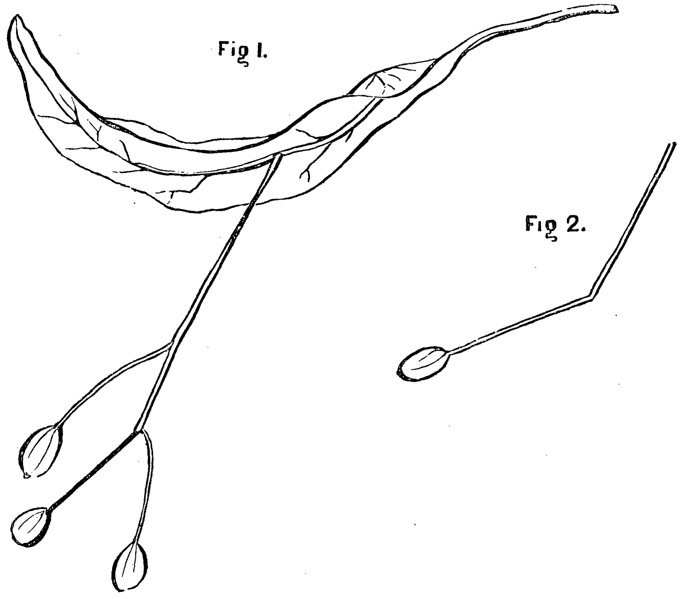

FIG. 1.—Bract, with its cluster of ripened nuts; FIG. 2.—A more frequent condition.

I would add that usually, the nuts more or less break off before the disarticulation of the scale from the tree, one or two only remaining, and these standing somewhat at right angles to the main peduncle. May not this throwing of the weight to one side, itself induce the revolution?—*W. W. Bailey, Brown University, Oct. 15, 1881.*

THE SENSITIVENESS OF TENDRILS.—Some years since, in order to measure the sensitiveness of the very fine and slender tendrils of *Cobœa scandens*, I placed one evening at seven o'clock, a human hair about two inches in length upon an expanded tendril. This was done with the greatest care, so as not to produce any other irritation than that due to the weight of the hair itself. Upon examination the next morning at seven o'clock, the tendril was found to have tightly clasped around the hair, and coiled itself into a tight knot. Every precaution had been taken to prevent interference with the experiment, so that it may be considered as certain that the contact of the hair was the exciting cause of the twining of the tendril.

THE SUPERABUNDANCE OF POLLEN IN INDIAN CORN.—Nature evidently intends to secure the fertilization of the young ovules in the Indian Corn (*Zea Mais*) beyond all chance of failure. In the autumn of 1875, I made a large number of careful counts and estimates which resulted in fixing upon twenty-five hundred as the average number of pollen grains in each anther. Each panicle of male flowers (the "tassel") was found by careful estimates, to contain about 7200 stamens, so that the number of pollen grains produced by each plant is about eighteen millions. Allowing two ears of one thousand kernels each, to each plant (a very high estimate), there are still nine thousand pollen grains for every ovule to be fertilized!

THE COMMON NAMES OF OUR PLANTS.—An effort is now making to collect and arrange the common names now borne by the plants of the United States, somewhat as has been done for English plants by Prior in his "Popular Names of British Plants," and Messrs. Britten and Holland, in the "Dictionary of English Plant Names." Whatever may be said against common names on account of their frequently objectionable form, their common application to several entirely different plants, besides other objectionable features, not to mention their little value to the practical botanist, it yet remains that plants are known to a very large portion of our people by common names only. We must confess to a rather kindly feeling for these popular names, in spite of their many faults and sometimes exasperating inconstancy and inconsistency, and so we hail, with delight the announcement made by W. R. Gerard, one of the editors of the *Torrey Bulletin*, of his intention to undertake to record the names under which the same plants are known in different parts of the country. As this is a movement in the right direction, undertaken by one eminently qualified to complete it, we have no hesitation in urging readers of the NATURALIST, to render aid "by collecting lists of the popular names by which our plants are known in their neighborhoods," and sending them to Mr. Gerard (9 Waverly Place, New York City), accompanied of course by the scientific equivalents. It is known that many of the so-called common names given in the books are merely book-names, having no usage except in botanical classes in schools, and with those whose knowledge of plants is derived mainly from books; it is desirable that such be carefully distinguished from those in use by people who have no knowledge of the botany of the books. The names given to plants by the Indians, are also of interest, and should be preserved.

COREOPSIS ROSEA.—In Gray's Manual of Botany, *Coreopsis rosea* Nutt. is marked rare, and credited to Plymouth, Mass. It occurs abundantly on the sandy, wet shore of Waushakum pond, South Framingham, Mass., and it has also been found by Dr. E. A. Daniels, Medway, on the shores of Kingsbury's pond. The receptacle is distinctly conical, and as my 1859 edition of Gray says, under the generic title, "receptacle flat," I must acknowledge the kindness of Dr. Daniels, in identifying the plant from Nuttall's description.—*E. Lewis Sturtevant, South Framingham, Mass., Oct. 19, 1881.*

CERATOPHYLLUM DEMERSUM IN FRUIT.—Gray, in his Manual, says that *Ceratophyllum demersum* L. is "common but rarely seen in fruit." I have to-day the pleasure of finding the plant in this somewhat uncommon condition.—*Dr. Alfred C. Stokes, Trenton, Aug. 30, 1881.*

BOTANICAL NOTES.—The opening address before the Geographical Section of the British Association for the Advancement of Science, was given this year, by Dr. J. D. Hooker. Very naturally the address was principally concerned with the geographical distribution of plants, which was reviewed historically.——T. R. A. Briggs calls attention, in the *Journal of Botany*, to the fact, that hybrids occur between some of the species of *Epilobium*, and describes one between *E. hirsutum* and *E. montanum*. Have our species been observed to hybridize?——De Bary is publishing in the current numbers of the *Botanische Zeitung*, an important paper, on the *Peronosporeæ*. If possible a summary will be given in these columns before long.——The "Catalogue of the Plants of Indiana," which has been publishing in parts as extra sheets in the *Botanical Gazette*, has appeared in pamphlet form. In all there are recorded 1432 species of flowering plants and vascular cryptogams. Valuable notes are appended to many of the species. The "characteristic forest trees are the poplar (*Liriodendron*), maple, ash, elm, black and white walnuts, oak, hickory, beach, sycamore." The authors (Professors, J. M. and M. S. Coulter, and C. R. Barnes) further state in their preface that "the flora of the State is readily divided into four groups, each marked by the physical aspect of the region in which it is found; these regions may be called (1) 'the river valleys,' (2) 'the lake borders,' (3) 'the prairies,' and (4) 'the barrens'."——Brefeld's recent studies of Entomophthoræ, lead him to regard them as constituting a small family closely allied to the Ustilagineæ, or possibly through *Entyloma*, merging into the latter. As the Entomophthoræ are clearly oösporous in their sexual reproduction, Brefeld must consider the spores of Ustilagineæ as actually oospores, modified and degraded by excessive parasitism. This would bring the Peronosporeæ, Saprolegniaceæ, Entomopthoræ and Ustilagineæ into a series of allied orders, and would separate quite widely the last named order from the Uredineæ, heretofore usually associated with them.——The reviews of Pfeffer's new book on the Physiology of Plants (*Pflanzenphysiologie*, Ein Handbuch des Stoffwechsels und Kraftwechsels in der Pflanze. Band 1. Leipsig, 1881) indicate that when completed, it will be a most valuable acquisition to the literature of this department of botany. Why cannot some of our publishers secure the translation of this work?——The late Professor Parlatore, before his death, had planned a work on the Comparative Anatomy of Aquatic Plants, which unfortunately was left unfinished. The fragmentary work consisting of nine fine plates showing figures of cross and longitudinal sections of different organs, together with explanatory text, has been published in Florence under the title of *Tavole per una "Anatomia della piante acquatiche."* Species of *Alisma*, *Callitriche*, *Ceratophyllum*, *Hippuris*, *Myriophyllum*, *Naias*, *Nelumbium*, *Nuphar*, *Nymphæa*, *Potamogeton*, *Trapa*, *Vallisneria*. *Victoria*, and many other phanerogams, and of *Iseries*, *Marsilia* and *Pilularia* among vascular cryptogams, are included in the figures.——Dr. Karl Kraus' observations upon the flow of sap from cut surfaces of plants, promise when completed, to throw light upon the poorly understood subject of the movement of fluids in plants. The sieve tissue of the fibrovascular bundle appears to conduct fluids most abundantly, although other tissues can act as conductors, as the fibrous envelope of some bundles, and the immature trachery tissue of others. Even collenchyma may serve as a conducting tissue. Mature vessels (tracheary) conduct no sap, and parenchyma does so only when sap is exceedingly abundant.

ZOÖLOGY.

THE CŒLOMA THEORY.—Since Haeckel's publication of his Gastræa theory, the most important generalization in embryology is the Cœloma theory of the brothers Hertwig.[1] It is an expression of the history of the nature and changes of the middle layer of the blastoderm.

They define two types of middle layer as follows: In the first, it is formed of separate cells which wander from the epiblast and hypoblast, which in some instances appear round the mouth of the gastrula. This they call the *mesenchym*. In the second type, the layer is divided as two strata of cells from the epiblast. To this form they restrict the name *mesoblast*. Moreover in the animals which present the mesenchym, there is a cavity between the epiblast and hypoblast, which is not the true body-cavity. Such are the Plathelminths (flat worms) Bryozoa and Mollusca. To this series they give the name of *Pseudocœlia*. The echinoderms, brachiopods, round worms, arthropods and vertebrates possess a mesoblast. Here the two layers of the mesoblast separate and form the walls of the body cavity, which is divided by the intestine into two chambers. To this division is given the name of the *Enterocœlia*. Animals are thus divided into two divisions, those in which the blastoderm consists of two layers, and those in which it is formed of four layers.

The consequences of these modes of origin are seen in charac-

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[1] Jenaische Medicinische Zeitung. 1881.